Three Revolutions:
From Training to Learning and Team Building

TO PREPARE a video program titled "All We Could Be," I interviewed Army leaders about the rebuilding of the Army that occurred from the time of the Vietnam war to Operation Desert Storm.[1] We discussed doctrine, training, leader development, organization, materiel, and soldiers (DTLOMS). While most agreed that the change in Army DTLOMS during this period was evolutionary, all believed that the changes in training were revolutionary. Either the training changes or the improved quality of personnel in the all-volunteer force was the dominant influence in the Army's successful transformation after Vietnam. There has been ample focus on the recruitment of quality soldiers that has led to the individual competence associated routinely with today's special operations forces (SOF). Leaders have not discussed the training dimension as much as they have discussed the value of quality personnel. Yet, it is training that produces quality soldiers.

Change in training has accelerated since Operation Desert Storm. The Army is now passing through an impressive second training revolution and is poised to launch a third that will be more important at every level (strategic, operational, and tactical) than the preceding two. The second revolution enlarged development and emerging institutionalization from training to education. Now there is potential expansion from traditional learning to effective, efficient learning and teaching for individuals, teams, and perhaps, units. The expansion will also build and sustain high-performing teams of leaders across the range of America's Army, including joint, interagency, intergovernmental, and multinational (JIIM) organizations.

The First Training Revolution

The training revolution began in the 1970s when the emerging U.S. Army Training and Doctrine Command (TRADOC) advanced the following deceptively simple propositions:

- Conduct performance-oriented training; soldiers train best by doing.
- Train to task, condition, and standard (TCS); this is the systems approach to training.
- Realize that all training is evaluation, and all evaluation is training.

These propositions, which spawned an enormous effort to define individual and collective tasks, provided the basis for soldier training and evaluation products that range from soldier manuals to Army training and evaluation programs.

Conduct performance-oriented training. In the 1980s, the Navy's successful Top Gun fighter training program inspired the creation of the National Training Center (NTC) as the first of the combat training centers (CTC). Planners also developed an innovative individual and collective training model and sought ways to better distribute training support to soldiers in units. These efforts were successful beyond TRADOC's original expectations and had revolutionary effects on Army readiness.

Training to task, condition, and standard. Well-defined, common training requirements drew the active force and reserve forces together by establishing uniform training requirements and assessment across the total force. Soldiers and officers were uniformly trained in their military occupational specialties and officer specialty codes, respectively. This was an enormous benefit to unit leaders in a globally deployed force. The rigor permitted fair, un-

biased assessment of individual task proficiency. TCS was of great value in implementing equal-opportunity programs. Either a soldier performed to TCS, or he did not. If he did, he was rewarded. If he did not, he was out. This standard applied to Active Component (AC) and Reserve Component (RC) soldiers. Without such accepted assessment tools, the Army might not have been able to introduce equal opportunity as rapidly as it did, given America's litigious society.

The component parts of the CTC model are observer/controllers (OCs), an opposing force (OPFOR), the after action review (AAR), and an accurate instrumentation system. The CTC's original mission was to prepare leaders for a unit combat environment. Improved unit mission readiness was highly desirable, but it was secondary to leader development. All current corps commanders have shared the CTC experience of fighting a tough enemy with unrelenting combat requirements while being observed by experienced mentors/coaches/trainers. Company, battalion, brigade, and division commanders experienced the crucible of CTC training and assessment. The Army now has the equivalent of General George Marshall's black book of highly competent leaders from which he made assignments at the beginning of World War II. Today, CTC-revealed "combat producers" are known and assigned with care when combat looms.

Evaluate training. An important aspect of training is the enduring effect on leaders of the AAR process itself. The Army is the only army in the world that permits commanders and their tactics to be criticized in front of, and often with the participation of, their subordinates. This has created a vitally important openness in working through success or failure on the battlefield. Openness creates a strong chain of command team and a unit culture during the unit's rotation. Members of the unit work through issues together to beat the OPFOR. Add to this candor the expectation that the OPFOR will fight no holds barred just as an enemy will, and the Army has a superb method for introducing change. If a technique works at the CTC against the OPFOR, troop acceptance is certain. This is a practical vehicle for accelerating assimilation of ongoing Transformation.

Distributed training support. Fortunately, TRADOC invested heavily in provisioning training support (supplying training aids, devices, substitutions, and simulations) for individual and collective training in schools and units. While there were occasional failures, excellent material has been developed to support distributed training. Stimulated by the high

costs of training a mechanized unit, distributed virtual simulation (originally suing the simulation network), which the Defense Advanced Research Projects Agency created, was expanded and linked with constructive and live simulations in a larger tactical engagement simulation (TES) program.

Through TES, the Army established both requirement and capability-excellent distributed training. Aside from expanding training opportunities (particularly for RC units routinely separated from their

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equipment), the great power of TES is its ability to train repetitively on all combat tasks, including tasks that are too costly or too dangerous to actually perform on the ground during peacetime. TES enabled continual experiential training for individuals and units, and repetitive training is critical for attaining and then sustaining high levels of task proficiency.

By the end of the first revolution, all of the ingredients for a global leap-ahead in training were present and had been assessed during Operations Desert Shield/Desert Storm. All that was required to take advantage of emerging training opportunities was the Internet.

There had been profound improvement in Army training during the 1970s and 1980s. Equally important, the DTLOMS paradigm had been broadly confirmed, ensuring that training fit into balanced force development. Not only was individual-soldier training highlighted, leader training received an equally important status. Leader development became a major Army program. The Army's performance during Operation Desert Storm demonstrated success for all. But that success was not a ceiling, it was a substantial floor that supported accelerated expansion from training to learning (training and education) and teaching in the 1990s.

The Second Training Revolution

The next steps in the revolution were—

▢ To draw on the power of the Internet.

▢ To expand the focus from training to education (grouped in this article as learning).

▢ To include leaders and self-development in the domains where learning had to be provided.

□ To better focus learning by structuring the learning experience.

□ To increase the intensity of learning experiences.

Effective distributed learning to standard has been an Army objective for years. The Army exported print and video media used for classroom instruction to distributed classrooms and to units. After an

As the spectrum of conflict broadened from a focus on midintensity conflict to low-intensity conflict, SASO, and counterterrorism, the need for adaptive, self-aware officers grew. The central conclusion of the recent Army Training and Leader Development Panel was that officer and NCO preparation in "how to think" as well as "what to think" should be increased.

unsuccessful beginning in the 1970s with training extension courses on videodisc, trainers distributed content through the use of CD ROMs. The Army developed various combinations of synchronous and asynchronous instruction that drew on telephone-linked computers or satellite-distributed courses using video-teleconferencing techniques. The proponent school exported course and classroom instruction to schools or units.

Modifying content for effective distributed learning is difficult and costly. There are reservations about the effectiveness of using material designed for individual instruction to train teams such as unit staffs. Performance has not yet matched clear potential.

When the new training system, with its associated tools such as AAR and TES, was added to the Internet's emerging capabilities, the training revolution gradually expanded to a learning revolution. As additional educational programs, such as the Command and General Staff Officer Course at Fort Leavenworth, Kansas, employed TES, the distinction between training and education blurred. As the spectrum of conflict broadened from a focus on midintensity conflict to low-intensity conflict, stability and support operations (SASO), and counterterrorism, the need for adaptive, self-aware officers grew. The central conclusion of the recent Army Training and Leader Development Panel (ATLDP) was that officer and noncommissioned officer (NCO) preparation in "how to think" as well as "what to think" should be increased.[2] The blurring between leader education and leader training has intensified as JIIM considerations influence more op-

erations. Now it is no longer a training revolution; it is a learning revolution. Trainers and educators both expect improvements in learning. This is an important change in the Army's expectations for the Objective Force and beyond, and it is an important enabler for the next revolution.

Since the 1970s, individual and collective training domains have been the school and the unit; these two domains, however, are not sufficient. A third domain, professional self-development, needs to be acknowledged. Professional reading has been encouraged for years. Content can be distributed to office or home via the Internet, and the requirements for distributed continuing education grow as the intensity and variety of force deployment increases. As a result, a requirement for self-development programs has become necessary.

Another expansion was the addition of the leader as a focal point of learning preparation.[3] In an organization that professes to be leader-dominant, it is important to focus on preparing warrior leaders to lead, not to manage. The DTLOMS imperatives must address leader development formally. That is, leader development was institutionalized as another obligatory check block in the bureaucracy of force development.

A vital ingredient in learning is the presentation of the proper cue to the learning audience.[4] According to cognitive learning theory, a stimulus or cue triggers or sets the stage for a self-initiated response. Correct, timely cues stimulate good experiential learning. For example, training target acquisition requires correct target representation under varying combat conditions, including battle obscuration and chemical warfare. Cues might also be complex human interactions such as those required to negotiate with a difficult Serbian, Afghan, or Iraqi mayor. The solution to correct, timely cues has been to structure the learning situation. As I said in 1993, "The combination of training requirements [mandated by doctrine and civil restrictions] can be attained only by deliberate design or structuring of the training process to ensure that specific training events occur in the manner and sequence desired to achieve specific task training purposes."[5]

Lane training applied structured learning to live simulation on the terrain. The Close Combat Tactical Trainer provided structure to virtual simulation. The best-structured learning experience is at the CTCs. Mission rehearsal exercises conducted before units deployed to the Balkans in the 1990s are also excellent examples.

Sustaining structured learning experiences is

An OPFOR at Fort Bliss, Texas, uses a Russian AN-2 bi-plane to simulate an unexpected chemical attack.

CTC OPFORs, including those of the Battle Command Training Program, are proud of their ability to replicate any potential enemy. They can make units fight a worst-case enemy as determined by national intelligence agencies. These CTC fights can be linked to CALL at Fort Leavenworth, to provide timely feedback from ongoing combat operations so that learning cues are current.

costly and complex because the experience must faithfully recreate actual operations if the learning cue is to engender seamless transition from training to operations. Cues change as operations progress, so updating based on detailed feedback from combat operations must be continuous. When leaders can use structured learning situations repetitively, exceptional learning takes place.

Varying the learning structure can intensify the learning experience. At the CTCs, increasingly experienced OCs introduced much of this variety. The best students were invited to become OCs, and the best OCs returned to the CTCs for repetitive tours of duty. This understanding of practical learning in a tactical environment is reflected in the experience base of the most senior leaders at the CTCs.

A typical NTC rotation provides an illustration of how intensifying the learning experience makes for great training. Keep in mind that the general officer from the unit in the rotation and the NTC's commanding general decide actions at the NTC. The units in training do not know what the general officers have scripted.

Depending on the unit's progress, the OPFOR is allotted daily battlefield enablers such as attack helicopters or persistent or nonpersistent chemical attacks to use against the unit in rotation. The normal guidance is to employ what the unit seems competent to handle "and then some." If a unit has not learned from a particular mission, it "recocks" and executes the same mission again.

Battlefield operating systems (BOS) meter the number, frequency, and complexity of the tactical situations presented to the unit. As each BOS becomes operational, it is stressed. Depending on how challenging the unit's actions are to be and how many BOS will be stressed simultaneously, the OCs present cues to the unit to trigger action. The OCs can vary the cues' complexity enormously.

The results are memorable learning and teaching experiences tailored to individual, leader, and unit capabilities. Intensity is varied to sustain the most effective learning environment. Having observed many engagements conducted during more than 100 CTC rotations, I attest to the remarkably improved efficacy and efficiency of tactical learning.

The Emerging Third Revolution

The effects of the two sequential revolutions multiply as in a geometric progression. There is substantial reason to expect this growth to continue as the ingredients of a third revolution appear. Several ingredients are now present. The Army has many exceptional ex-OCs, competent leaders who know how to draw on current learning tools to structure and intensify learning to develop high-performing individuals, leaders, and units. CTC OPFORs, including those of the Battle Command Training Program,

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Army Lessons Learned (CALL) at Fort Leavenworth to provide timely feedback from ongoing combat operations so that learning cues are current.

The ATLDP recommends increased use of CTC expertise for doctrine development, thus closing the loop to responsive adjustment of doctrine and tactics, techniques, and procedures (TTP) to ongoing operations.[6] In addition, improved instrumentation measures more detail.

Another ingredient is the AAR process, which conducts mentored discussions of tactical strengths and weaknesses up and down the chain of command. These discussions include an introspective review of battle command and command style. The chain of command is developed as a vertical team of leaders. As the rotation progresses, the outcome can be seen in improved confidence, competence, and frequently, shared vision and trust. The process enables the preparation of high-performing vertical teams of leaders, which is a new domain of leader preparation.

The success of seamless unit handovers in Balkan deployments proves the validity of applying various learning processes to prepare individuals, leaders, and units for successful operations. The process is effective; the job of making it more efficient is a third-revolution task.

The new ingredients that have emerged to accelerate and expand the effects of the past two revolutions include—

 The substantial downward migration of leader tasks.

 The opening of important new learning domains.

 The development of a model to focus leader-team and team-leadership preparation.

 The emergence of powerful Internet-based, military-oriented communities of practice (COP), Army Knowledge Management (AKM), and Army Knowledge Online (AKO).

Substantial downward migration of leader tasks. The combination of competent, motivated, volunteer soldiers and distributed tactical data and information are driving task-performance responsibilities down the chain of command. The leading edge of this powering down to ever-lower echelons is present in individual SOF soldiers directing B52 strikes in Afghanistan. Land Warrior will bring these capabilities to the infantry squad of the Objective Force. Corporals are expected to master tasks formerly expected of senior NCOs, who in turn, have assumed many responsibilities formerly expected of officers.[7] All corporals and above should be considered leaders and should be prepared as adaptive, self-aware leaders. Further, they should be trained to assume duties one to two grades higher in the event of casualties.

The opening of important new learning domains. The first revolution addressed individual and collective training in institution and unit. In U.S. Army Field Manual (FM) 7-0, *Training the Force*, this training was expanded to acknowledge leader preparation and self-development.[8] This is necessary but insufficient. Teams should be addressed as an important domain, and leader development should be applied to all activities of America's Army.

Formerly, training venues were divided into four domains (figure 1). Individual training had to be prepared for soldiers in schools and in units (domains 1 and 2). In addition, collective training had to be provided to institution and unit, with the majority of the collective training occurring in the unit. The collective training established domains 3 and 4. This created four domains for which effective and reasonably efficient training programs had to be prepared.

FM 7-0 added self-development and leader-development to the mix, creating a total of nine
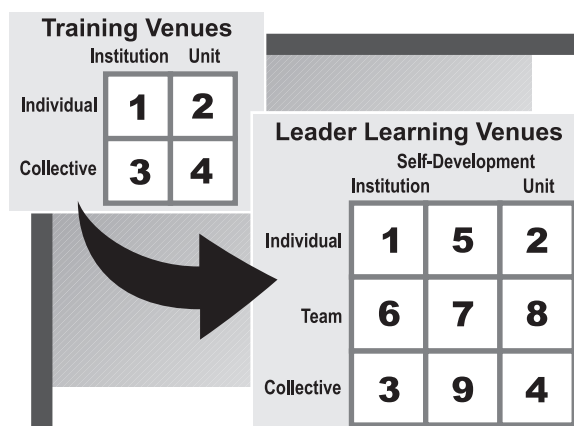

Figure 1. Training venues to leader learning venues.

A joint team transmits data during Millennium Challenge 2002.

The implications of Transformation and combat in Afghanistan and Iraq are being discussed on companycommand.com. In addition to these voluntary peer relationships, virtual teams of leaders from vertical and horizontal echelons (either grouped or distributed) provide data, information, and knowledge-sharing practices.

domains. However, that formulation aimed too low in terms of the objectives and the capabilities of America's Army. The leader venue of FM 7-0 should be replaced with a team venue (domains 6, 7, and 8). With the advent of vastly expanded data and information exchanges associated with Army digitization, no one acts alone. At every echelon across BOS, individuals perform as members of teams.

Soldiers are always part of vertical teams because the Army is a hierarchical organization. At the same time, soldiers are members of horizontal teams with buddies, wingmen, or peers at the same echelon. Therefore, it is necessary to prepare teams from the operational unit or organization (domain 8). It is also important to develop doctrine and TTP for "how to team" that is prepared and learned by individuals in the institution (domain 6). An essential complement is how to develop the skills, knowledge, and attributes (SKA) of productive team members through team self-development (domain 7). Domains 5, 7, and 9 are vitally important because they represent the initiative characteristic of America's Army. Clearly, however, more learning and research and development of appropriate supervision, mentoring, assessment, and feedback is required.[9]

A second and more profound change to current doctrine is the expansion of all nine domains from training to leader learning and teaching. The Army prepares leaders as high-performing individuals, as leaders of teams (crews, sections, staffs, commanders), and as leaders of elite units or organizations (the Ranger Regiment, for example). The dominating objective of all individuals, teams, units, or organizations is excellence. Neither training nor education is adequate by itself to create adaptive, self-aware leaders. Some of each is always necessary. Combining training and education is essential.

SKA, or their equivalent, are required for each of the nine domains. For example, the SKA for team preparation are separate and distinct from those essential for individual leader preparation. FM 22-100, *Leadership*, provides the latter.[10] Unfortunately, the doctrine only addresses individual leader preparation. Team leadership should consist of a shared vision or purpose, shared trust, shared competence, and shared confidence. Note the repetitive requirement for sharing SKA. In each case, a team's SKA is not the same as an individual's SKA. Think of the shared SKA as the overlap area in a Venn diagram.[11] Developing team vision, trust, competence, and confidence is essential to preparing and

sustaining high-performing teams. Similar SKA become collective tasks for units and organizations to acquire in order to become high performing. For tactical units, these SKA are developed in the alchemy of superior unit performance created at CTCs.

A model for leader-team and team-leadership preparation. Figure 2 indicates a way to think about leader teams. The horizontal areas represent echelons of command from platoon to division. The vertical areas are BOS. A horizontal staff team, consisting of the S2, fire support officer, and S4 is shown at battalion. The dotted arrow represents the vertical chain of command. Note in the Intelligence BOS, that the leader-team is a combination of commanders and staff officers (S2s and military intelligence unit commanders). I call this a chain of functional support, seen regularly among NCOs. Often, there are other command and staff teams that cross functional lines. Last is the requirement for competence, confidence, purpose, and trust. The chain of command is the most important team of leaders, but other teams, such as chains of functional support, also need preparation if a unit is to be high performing.

What if joint or multinational operations are involved? Figure 3 addresses that in a SASO environment. Notice that the vertical areas now represent vertical teams responsible for SASO functional areas, such as negotiations. A NATO division has been interjected. No longer is it an Army chain of command with well-understood responsibilities and authorities; it is a chain of coordination.[12] A command-staff functional team consisting of commanders, force protection, and information operations staff leaders addresses a riot threat.
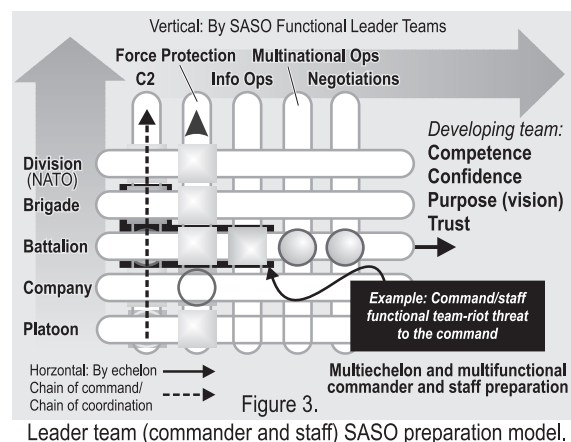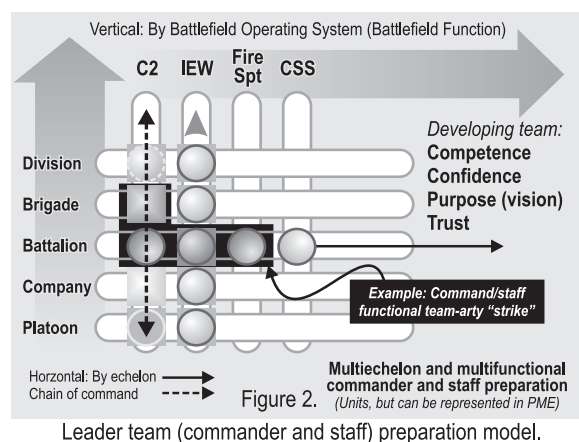
Since the events of 11 September 2003, teams are increasingly likely to be JIIM. In fact, JIIM seems likely to be the area of greatest application of the leader-team preparation model. Other agencies or organizations operating in a JIIM environment will have little or no knowledge of Army doctrine and TTP. Nor will there exist JIIM BOS to frame actions. Nor will there be learning/teaching as occurs in chains of command or chains of functional support. Doctrine and TTP for chains of coordination in JIIM evolve through practice in various multinational counterterrorism operations. For now, the model might support best by indicating from where the various leader teams might come or where they might be prepared.

Many individual leaders, leader teams, and lead units need to be prepared. Most learning tools were developed in the second revolution, but they have not been applied to the various learning audiences mentioned. In fact, the Army doctrinal page seems blank in some of these areas. CALL currently addresses only individual leaders and not teams of leaders. This leaves room for third-revolution exploitation. When including emerging Internet capabilities that link individuals, teams, and units globally, even more room exists for potential exploitation.

The emergence of powerful Internet-based, military-oriented COPs, AKM, and AKO. Effective communication encourages routine exchange of data and information. This is true vertically for the exercise of command and horizontally for coordination. Less appreciated is the recent emergence on the Internet of virtual COPs that address important professional issues. Currently, there is one officer COP and one NCO COP.[13] Both are growing, and the Army will soon launch similar sites, such as battalioncommand.com and platoonleader.army.mil/ to discuss important issues. In time, there will be a family of COPs where concerned professionals can share data, information, and knowledge.

In COPs discussions, the merits of alternative methods are often considered. Mentors direct the discussions to subjects of mutual interest. Recently, the implications of Transformation and combat in Afghanistan and Iraq are being discussed on companycommand.com. In addition to these voluntary peer relationships, virtual teams of leaders

Figure 2.
Leader team (commander and staff) preparation model.

Figure 3.
Leader team (commander and staff) SASO preparation model.

from vertical and horizontal echelons (either grouped or distributed) provide data, information, and knowledge-sharing practices. Many opportunities exist to stimulate leader-team acquisition of the SKA of high-performing teams. Some of these opportunities might come from a distributed chain of command that is likely to assemble only after deployment or in a chain of coordination assembled in the objective area.
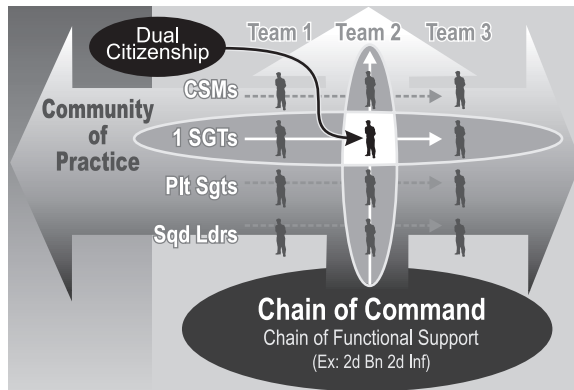

Figure 4. Exchanges of data, information, and knowledge in "double knit" relationships.

Added to this are horizontal or peer COPs that support vertical virtual teams of leaders in execution of their responsibilities. This interaction of vibrant vertical and horizontal exchanges of information and knowledge is termed "double knit."[14] Figure 4 illustrates how this can occur in a tactical unit. In this case, horizontal COPs at each leader level support the vertical chain of command or chain of functional support (team 2).

The third revolution will use these new ingredients to create and sustain high-performing leaders as individuals; as vertical and horizontal teams of leaders; and as leaders of highly proficient units.

Potential Applications

The third revolution would support the preparation and maintenance of high-performing individuals, leader teams, and units of the active force. Additional applications could be used to create high-performing teams in units composed of late additions to the task organization, including—

- Joint forces en route to an objective area.
- Teams in units anticipating lateral entry of highly qualified reservists, Department of the Army civilians, contractors, or retirees.
- Teams of personnel drawn from JIIM organizations grouped for overseas counterterrorism operations.
- Teams hastily assembled for Homeland Defense under a state governor.[15]

Whatever the contingency, the new learning capabilities likely to emerge during the third revolution will focus on intensified learning practices and emerging distributed learning and team building. These new capabilities also could be provided to high-performing teams experiencing substantial leader personnel turbulence or turnover. Even if the Army succeeds in establishing a unit-replacement system, functional support will still change as organizations adjust to the right mix of combat, combat support, and combat service support capabilities needed to dominate enemies. Individual leaders need to develop high-performing leader teams in lead units. These requirements and new capabilities will expand across the full spectrum of JIIM organizations. Thus, the advances of the first and second revolutions will launch and support the third. It would be a serious error to draw on this emerging whole, which is much greater than the sum of its parts, to fix the past rather than to invent a better future. ***MR***

NOTES

1. LTG Frederic J. Brown, "All We Could Be," *AUSA,* on-line at <www.firstpersonaudio.com/2002/html/video-allwecouldbe.html>, 2002.
2. For an excellent summary of ATLDP, see Joe LeBoeuf, "Case Study No. 3: The 2000 Army Training and Leader Development Panel," *The Future of the Army Profession,* ed., Don M. Snider and Gayle L. Watkins (New York: McGraw-Hill, 2002), 487-504.
3. See U.S. Army Field Manual (FM) 7-0, *Training the Force* (Washington, DC: U.S. Government Printing Office [GPO], 21 October 2002), I-4.
4. This challenge first emerged for company-size maneuver units when the tube-launched, optically tracked, wire-guided missile (TOW) was fielded. With a range of 3,000 meters and a night sight, the TOW made it exceedingly difficult to replicate combat cues for routine training. Only battalion or higher had the resources to support company TOW training. Thus began centralization of Army training.
5. Brown, "Training Third Wave Landpower: Structured Training," *IDA P-2947* (December 1993): S-1.
6. LeBoeuf, 497.
7. For a discussion of the effect of "cascading excellence," see Brown, "Transformation under Attack," *Military Review* (May-June 2002): 7. For implications of junior leaders, see Brown, "Imperatives for Tomorrow," *Military Review* (September-October 2002): 87.
8. FM 7-0.
9. In a perceptive commentary, Jack Hiller suggests that self-development be retitled to semiautonomous and that a substantial mentoring program be considered for domains 5, 7, and 9 to provide "feedback from a respected mentor for learning tactics, strategies, agility and flexibility."
10. FM 22-100, *Military Leadership* (Washington, DC: GPO, 31 August 1999).
11. Venn diagrams link two items by their characteristics or attributes. For more information, see <www.graphic.org/venbase.html>.
12. For more on chains of command, chains of functional support, and chains of coordination, see Brown, "Vertical Command Teams," *IDA P-2728* (June 2002).
13. For more information, see companycommand.com and squadleader.com.
14. Etienne Wenger, Richard McDermott, and William M. Snyder, *Cultivating Communities of Practice* (Boston: Harvard Business School Press, 2002), 18-21.
15. DA white paper, "The Objective Force in 2015," final draft, 8 December 2002, 11. Available on-line.

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